includes almost 500 boreholes. The surface here is underlain by thick sequences of organic sediments, clays and sands deposited by the rivers in channel and interchannel floodplain settings, predominantly in response to eustatic sea-level rise. The sequences are internally complex, but detailed radiocarbon dating using already available dates, supported by a series of new accelerator mass spectrometry (AMS) determinations, provides a superb chronological framework for the detailed sedimentological studies.

The first part of the collection is subtitled 'Improving radiocarbon control of Holocene deltaic fluvial systems' and includes four papers. They are: 'Accurate dating of organic deposits by AMS ^{14}C measurement', 'Optimising sampling strategy for radiocarbon dating', 'Calibration of ^{14}C histograms' and 'Calibration of radiocarbon ages'. Three of these are in press in *Radiocarbon*, whilst one is published in *Boreas*. The second part is the sedimentological study entitled 'Holocene channel pattern development and avulsion history of the Rhine–Meuse delta'. It comprises papers on the 'Alternation of meandering and anastomosing fluvial systems', 'Facies architecture of an anastomosing distributary system' and the 'Avulsion history of the River Rhine' (published in the *Journal of Sedimentary Petrology, Sedimentary Geology*, and unpublished, respectively). The thesis is completed by a short general conclusion.

Overall this is a first-rate compilation of valuable articles. It demonstrates clearly the level of sophistication that can be achieved using standard field methods supported by stringent laboratory analysis in areas where a high density of information is available. The thorough scientific approach makes this an excellent study that will be very useful for those interested in lowland rivers and the problems of radiocarbon dating Late Quaternary sediments. I am also sure that it will provide an excellent foundation for Dr Törnqvist's research career.

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THE CASE FOR A STABLE EAST ANTARCTIC ICE SHEET edited by David E. Sugden, David R. Marchant and George H. Denton, Geografiska Annaler Series A, Volume 75 (4), 151–351. Scandinavian University Press, Oslo, 1993. Price for Volume 75: NOK 595. ISSN 0435-3676.

This volume consists of free-standing and independently refereed papers arising from the Vega Symposium, 26 April 1993, Stockholm. The impetus behind the symposium was the ongoing debate concerning the stability of the East Antarctic ice sheet. As the title implies, this volume presents the case for a stable East Antarctic ice sheet, and includes new work as well as reappraisals of existing evidence. Much of the material comes from the Dry Valleys sector of the Transantarctic Mountains.

The first paper presents a broad, geomorphological overview of the landscapes in the Dry Valleys (impressively illustrated in colour) and argues that the landforms in this region seem to imply that the climate has been a hyper-arid cold desert since the end of the middle Miocene. The second paper then reviews marine evidence from around Antarctica, and again argues that these data suggest cold sea-surface temperatures since the late Miocene. The third paper uses a modelling approach to address the problem, using the modest climatic changes suggested by the marine evidence in particular, and argues that no significant decay of the ice sheet would have occurred in the middle or late Pliocene. The remaining four contributions then present rather more detailed analyses of data from the Dry Valleys area relating to glacial history, volcanism, tectonism and marine incursion. These all support a hypothesis of landscape stability for at least the last 13·6 Ma. Most of this work is critically dependent on dating of *in situ* volcanic ash deposits.

Although the papers can be read independently, if read in order they build a convincing argument for a stable ice sheet, and thus support the 'conventional wisdom', based on marine and terrestrial work in the 1970s and 1980s, that the East Antarctic ice sheet has been stable since around 14 Ma BP. This view has been challenged more recently by the discovery of fragments of *Nothofagus* (Southern Beech) and reworked marine diatoms in a glacial deposit, the Sirius Group, high in the Transantarctic Mountains. Dated to the late Pliocene, around 3 Ma BP, these deposits have been interpreted as implying that palaeotemperatures must have been 20–25°C warmer than at present, and that the incorporation of marine debris implies glacier advance, from a much reduced ice sheet, over marine basins in the interior of East Antarctica. If correct, this hypothesis and the ice sheet instability it implies, would have major implications for our understanding of the global climate of today, its evolution over the last few million years, and possibly for projections of ice sheet changes and sea level rise in the future. What this volume does not address, however (and the editors admit as much in their introduction), is how the Sirius Group deposits can be explained given a stable ice sheet. Ultimately, then, it only tells half the story. A similar volume from the advocates of an unstable ice sheet would be very welcome, but ultimately the two opposing points of view must also address each others' evidence if this important debate is to be resolved.

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